



universal space network^{inc.}
access your world



Global Network for Commercial Access

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What We Do

- USN provides satellite management services through a global telemetry and command network
- USN supplies a broad range of solutions to meet diverse customer requirements
 - Commercial, NASA, DoD, and International



USN Services Overview

Mission Operations



- Operational procedure development
- Operator training
- Orbital analysis / mission planning
- In-orbit anomaly resolution
- Console operations
- Mission management
- Ground segment development

Network Management



- Single point of interface to MOC
- Three locations provide redundancy
- Automated operation of ground stations
- Performs scheduling and configuration management
- Staffed 24 by 7

Ground Stations



- Global remote ground stations
- Multiple antennas/site
- S-, X-, L- & Ku-bands
- Manned for LEOP
- Currently to 80Mbps

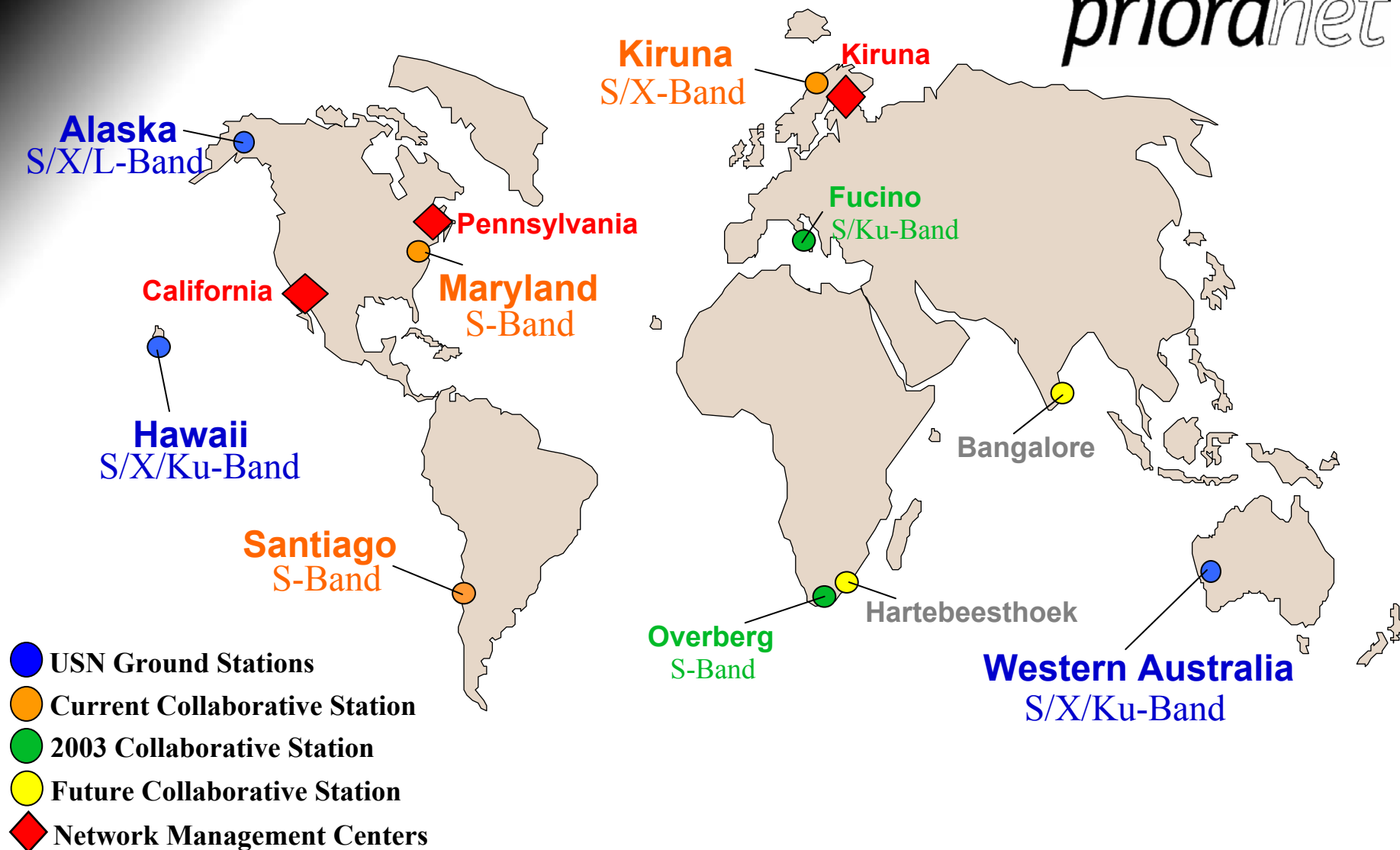
Wide Area Network

US Patent No. 5,940,739



Station Locations

prioranet





PrioraNet X-Band Missions

Mission	PrioraNet Location	Passes
Coriolis	USN Alaska and SSC Kiruna	1-4/Day
GALEX	USN Hawaii and USN Australia	4+/Day
Calipso	USN Alaska and USN Hawaii	1-2/Day
Numerous European X-band missions	SSC Kiruna	10-20/Day
Various NASA EESS	SSC Kiruna	2-4/Day



EES X-Band Frequency Challenges

- **Band allocation is becoming a challenge**
 - X-band is increasingly congested
 - Requires extensive frequency coordination
 - Requires mission downlink coordination

- **Geographic concentration of ground stations**
 - Optimal receive location (poles)
 - Increases frequency activity in the region
 - Missions compete for band/resource allocation
 - Adds pressure on resources for coordination
 - Who gets the station and band when?
 - What opportunities are missed due to conflict resolution and coordination



Near-Term X-Band Commercial Option

- Expand the current EES network to include commercial X-band tracking network

Advantages

- High Rate X-band non-polar stations provide possible relief for polar X-band crowding and RFI
- Additional capacity at the poles augments current stations

Challenges

- Requires high rate RF/baseband equipment augmentation
- Data latency and mission objectives may prevent use



Long-Term Options

- Use of existing and planned Ka-band networks
 - Iridium
 - Spaceway
- Add Ka-band resources to existing PioraNet stations as demand requires



Backup Slides



Alaska Ground Station

- ❑ North Pole, Alaska
- ❑ L/S/X-Band 13 Meter Support
- ❑ S-Band 3 Meter Support
- ❑ Remote Operation
- ❑ Redundant Components
- ❑ Operational June 1998





Hawaii Ground Station

- ❑ South Point, Hawaii
- ❑ S/X/Ku-Band 13-Meter Support
- ❑ S-Band 3.5 Meter Support
- ❑ Remote Operation
- ❑ Redundant Components
- ❑ Operational August 1999





Australia Ground Station

- ❑ Dongara, Western Australia
- ❑ S/X/Ku-Band 13 Meter Support
- ❑ Remote Operation
- ❑ Redundant Components
- ❑ Operational August 2000





Missions

- FUSE
- XM Radio
- SICRAL
- BIRD
- DirecTV-5
- Artemis
- Sirius 1, 2 and 3
- TIMED
- Bsat 2a,b, c
- N-Star
- Galaxy VII
- PAS-5
- TRIANA
- Coriolis
- GALEX
- SWIFT
- Calipso
- COSMIC
- Wideband Gapfiller
- Orbital Express
- Hotbird 6
- Hotbird 7
- Atlantic Bird 1
- EW5
- Optus C1
- Echostar 9
- Rosetta
- W3A

Customers

- Boeing Satellite Systems
- Space Systems/Loral
- Orbital Sciences
- Ball Aerospace
- Lockheed Martin
- Sirius Satellite Radio
- Telespazio
- DLR
- CNES (French Space Agency)
- Swedish Space Corporation
- PanAmSat
- NASA
- US Air Force
- Naval Research Laboratory
- University Corporation for Atmospheric Research (UCAR)
- National Oceanic and Atmospheric Administration (NOAA)